

REMARKS/ARGUMENTS

Reconsideration and allowance in view of the foregoing amendment and the following remarks are respectfully requested.

Claims 1-6 and 14 are now pending.

Claims 1, 2, 4-6 and 14 were rejected under 35 USC 103(a) as being unpatentable over Tatumoto et al in view of Kobayashi et al or Nanataki et al with or without evidence from the instant invention or Fujishiro et al. Applicant respectfully traverses this rejection.

Claim 1 has been amended above to specify that "a crystal phase is liquefied during the sintering so as to generate material transfer between sheets via a liquefied crystal phase" and that "the material transfer causes the sheets to be integrally bonded with each other". This amendment is supported by the original specification, in particular page 5, lines 12-23; page 7, lines 27-31; page 8, lines 1-8 and page 18, lines 9-15.

The present invention provides a multilayered gas sensing element having a solid electrolytic sheet and an insulating sheet having a heater laminated with each other. Because materials of these sheets differ from each other, it is necessary to strengthen the bond between the sheets. To strengthen the bond, a crystal phase containing silicon dioxide is disposed between the sheets. Silicon dioxide lowers a melting point of the crystal phase. Thus, when the sheets are sintered, the crystal phase is liquefied between the sheets, so that material transfer is generated between the sheets via the liquefied crystal phase. Because of the material transfer, the sheets will be tightly bonded to each other after sintering.

In contrast to the claimed invention, Tatumoto teaches a stratified ceramic body. Zirconia is employed as a main ingredient of a solid electrolyte 2, and Y_2O_3 is employed

as one of several stabilizing agents (see lines 28-30 of column 7). The solid electrolyte 2 is laminated on an insulating layer 4 having alumina and binder (column 8, line 47 and lines 55-56).

Kobayashi teaches a solid electrolyte having yttrium oxide, silicon dioxide and zirconium oxide (column 2; lines 44-48).

Nanataki teaches a partially stabilized zirconia. An MgO ingredient and Al_2O_3 and SiO_2 ingredients are present in a grain boundary (see Abstract). A preferred content of SiO_2 ingredients in partially stabilized zirconia ranges from about 0.3 to about 3.0%, preferably about 0.3 to about 1.5% by weight (see column 6, lines 7-9).

Fujishiro discloses an oxygen concentration sensor including an electrolyte cylinder 28 that has surfaces thereof metalized. Fujishiro discloses that the adhesion strength of the metallic coatings can be enhanced by fabricating the electrolyte cylinder from a solid electrolyte material which contains a minor amount of SiO_2 which apparently exhibits strong affinity for the metallic coating. The metallic coating in Fujishiro is provided to enable soldering of conductor members to the electrolyte cylinder.

It is respectfully submitted that Fujishiro's teaching with regard to SiO_2 present as a secondary phase and exhibiting a strong affinity for metallic coatings for soldering conductor members would not be considered relevant to the skilled artisan in connection with laminating and sintering a solid electrolytic sheet and an insulating sheet having a heater as recited in applicant's independent claim 1. Furthermore, Fujishiro does not teach or suggest the liquification of a crystal phase during sintering so as to generate material transfer between an electrolytic sheet and insulating sheet for integrally bonding the sheets to each other. It is therefore respectfully submitted that the skilled artisan considering Tatumoto would not consult Fujishiro nor be taught by Fujishiro the provision of a crystal phase as recited in applicant's claim 1, because

Fujishiro relates to a metallic coating for soldering a conductor and not to the lamination of an alumina porous layer to a solid electrolyte. It is therefore respectfully submitted that the Examiner's reference to and reliance on Fujishiro is improperly motivated by the Examiner's hindsight knowledge of applicant's claimed invention and is not a teaching that would be referenced by the skilled artisan without the benefit of applicant's disclosure. It is further submitted that Fujishiro would not in any event motivate the skilled artisan to modify Tatumoto so as to meet the limitations of applicant's independent claim 1.

It is clear that the initial burden of establishing a basis for denying patentability to a claimed invention rests upon the Examiner. In re Piasecki, 745 F. 2d 1468, 223 USPQ 785 (Fed. Cir. 1984). In establishing a *prima facie* case of obviousness under 35 U.S.C. § 103, it is incumbent upon the Examiner to provide a reason why one of ordinary skill in the art would have been led to arrive at the claimed invention from the prior art. Ex parte Clapp, 227 USPQ 972 (BPAI 1985). To this end, the requisite motivation must stem from some teaching, suggestion or inference in the prior art as a whole or from the knowledge generally available to one of ordinary skill in the art and not from applicant's disclosure. See, for example, Uniroyal, Inc. v. Rudkin-Wiley Corp. 837 F.2d 1044, 7 USPQ 2d 1434 (Fed. Cir. 1988).

As the CAFC has said, obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination. ACS Hospital Systems v Montefiore Hospital, 221 USPQ 929, 933 (Fed. Cir. 1984). There must be a suggestion in the art relied upon to use what one reference discloses in or in combination with the disclosure of the other reference or references relied upon by the Examiner. In re Grabiak, 226 USPQ 870, 872 (Fed. Cir. 1986).

As is apparent from the foregoing, Tatumoto, Kobayashi, Nanataki and Fujishiro do not teach or suggest a crystal phase which is liquefied during sintering so as to

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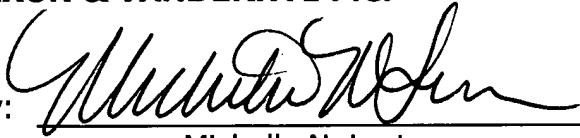
generate material transfer between sheets via a liquefied crystal phase. Consequently, they also fail to teach that such a material transfer causes the sheets to be integrally bonded with each other.

For the above reasons, it is respectfully submitted that claim 1 is clearly distinguishable from the teachings of Tatumoto, even if taken in combination with Kobayashi, Nanataki and/or Fujishiro, and thus, the rejection under 35 U.S.C. 103(a) should now be withdrawn.

All objections and rejections having been addressed, it is respectfully submitted that the present application is in condition for allowance and an early Notice to that effect is earnestly solicited.

Respectfully submitted,

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